

## CLAIMS

1           1. In a gas turbine engine which includes (1) an igniter,  
2           (2) a cable running from an exciter to the igniter which delivers  
3           electrical power to the igniter, (3) a first conductive shield  
4           surrounding the cable and connected to the engine, and (4) a second  
5           conductive shield extending from the external conductive shield and  
6           surrounding the igniter, a method comprising:

- 7           a) maintaining a sensor adjacent the igniter;  
8           b) detecting a current pulse in either the first or  
9           second conductive shields, or both; and  
10          c) issuing a signal indicating presence of spark when  
11          a current pulse is detected.

1           2. In a gas turbine engine which includes (1) an igniter,  
2           (2) a cable running from an exciter to the igniter which delivers  
3           electrical power to the igniter, (3) a first conductive shield  
4           surrounding the cable and connected to the engine, and (4) a second  
5           conductive shield extending from the external conductive shield and  
6           surrounding the igniter, apparatus comprising:

- 7           a) a coil adjacent the igniter;  
8           b) means for detecting a current pulse in either the  
9           first or second conductive shield, or both; and  
10          c) means for issuing a signal indicating presence of  
11          spark when a current pulse is detected.

1           3. Apparatus for detecting spark, comprising:

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2 a) a power source which applies a high voltage to a  
3 conductor connected to a spark gap, to cause dielectric  
4 breakdown in the spark gap;  
5 b) a current path for carrying return current from the  
6 spark gap to the power source when breakdown occurs;  
7 c) a conductive shield around the conductor; and  
8 d) a detector for detecting current in the conductive  
9 shield, and issuing a signal indicating presence of spark  
10 in response.

1 4. Apparatus according to claim 3, wherein the current path  
2 leads to a system ground.

1 5. Apparatus according to claim 4, wherein the conductive  
2 shield is connected to a system ground.

1 6. Apparatus according to claim 3, wherein the spark occurs  
2 in a gas turbine engine.

1 7. Apparatus in a gas turbine engine, comprising:

2 a) an igniter which is  
3 i) surrounded by a housing, and  
4 ii) fed by a power cable which is surrounded  
5 by a conductive shield which is connected to  
6 the housing; and  
7 b) a detector for

8           i) detecting current in the shield, housing,  
9           cable, or a combination thereof, but without  
10          contacting the cable, and,  
11          ii) in response, issuing a signal indicating  
12          presence of spark in the igniter.

1           8. Apparatus according to claim 7, wherein the engine powers  
2   an aircraft, and the signal is delivered to a pilot station in the  
3   aircraft.

1           9. Apparatus according to claim 7, wherein the detector  
2   comprises:

3           c) a coil, adjacent the shield, in which currents are  
4           induced.

1           10. Apparatus, comprising:

2           a) a gas turbine engine having a frame or casing having  
3           a potential defined as DC ground;  
4           b) an igniter in the engine;  
5           c) a supply cable which supplies current pulses to the  
6           igniter;  
7           d) a conductive shield around the supply cable, which  
8           connects to a housing of the igniter, wherein the shield  
9           and the housing are connected to said ground potential;  
10          e) an exciter which provides said current to the  
11          igniter, and which receives return current from the

12 igniter through  
13 i) said shield, and  
14 ii) a second path;  
15 f) a detector adjacent said housing, which detects one  
16 or more of the following:  
17 i) current pulses in the cable;  
18 ii) current pulses in the housing; or  
19 iii) differential between current pulses in  
20 the cable and current pulses in the housing.

1 11. Apparatus according to claim 10, wherein the second path  
2 comprises the engine frame or casing.

1 12. Apparatus according to claim 10, wherein the detector  
2 comprises a coil.